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TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

STATE OFFICE STILLWATER, OKLAHOMA 74074

PLANT SCIENCE TECHNICAL REFERENCES - FOR IN SERVICE USE ONLY

WOODLAND - OK-5 May 2, 1975

Re: Noise Reduction with Trees and Shrubs

Noise is unwanted sound, every year we hear more of it. Average community-noise level has risen 1 decibel annually the past 20 years. A 10-decibel increase in sound level approximately doubles the apparent loudness. Thus during this period, apparent loudness has increased fourfold.

Outdoor noise invades our recreation areas, parks, playgrounds, schools, and backyards. Research has proven tree and shrub screens to be effective in reducing disturbing sound levels to acceptable levels. In addition, trees and shrubs are most effective in reducing high frequencies--the frequencies which are most annoying to humans.

A few basics for using trees and shrubs for noise reduction are as follows:

1. Deciduous trees in full leaf are said by some to be more effective than evergreen trees in absorbing and diffusing upper middle and high frequencies; however, they lose their effectiveness when leaves fall. Conifers and broad-leaved evergreens are more effective for year-round noise reduction.

2. A planting should consist of both trees and shrubs for maximum effectiveness.

3. Best noise control is attained by planting shorter species toward the noise source and taller species toward the receiver.

4. Extending the tree and screen beyond the protected area increases effectiveness.

5. Where possible a distance of 75 feet or more should be available for tree and shrub planting and grassing between the noise screen and area to be protected.

6. Optimum results are attained by placing the tree and shrub screen as close to the noise source as feasible. Screens close to the protected area will give protection only to the area immediately behind the screen. Screens midway between the noise source and protected area are the least effective.

7. Dense barriers are the most effective; plant the trees and shrubs close together.

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8. Where the use of tall trees is not possible, shorter shrubs and tall grasses or similar soft-ground covers are superior to paved surfaces.

9. Generally the wider the screen, the more effective it becomes.

To reduce noise from moderate speed traffic, where engine exhaust and tire roadway interaction are the principal causes of noise, the tree and shrub screens should be designed to attain a width of 20 feet or more. In relatively quiet areas narrower screens improve conditions. Screens up to 50 feet are recommended for effective screening of noise along high-speed highways.

One should keep in mind, no matter how tall, dense, or wide, a tree and shrub screen will not eliminate noise. But when properly designed, noise can be reduced from disturbing to tolerable and more pleasant levels.

/s/ Hampton Burns
Hampton Burns
State Conservationist